Checkout Procedure For The Wiener VME Power Supply For The MINOS Far Detector Electronics

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Revision 1

Description:

The power supplies are to be used to power the MINOS Far detector VME electronics. They are model PL500/PL6021, F8 units produced by Wiener Plein & Baus GmbH. They are a 3U high with an alpha-numeric interface for monitoring voltages and currents and setting voltage and current limits. These supplies were chosen for their low output ripple and low EMI specifications. The user should become familiar with the contents of the "Modular Floating Power Supply System PL500 / PL6021, F8 User's Manual".

Checkout Procedure Of Wiener VME Power Supply (Far)

Date:_____ Tech Initials:_____ Prop Number: _____

Physical Examination:

1. Using a known good power supply compare the major mechanical aspects of the crate and report any deviations.

Electrical Examination

1. Load Test
   a) With the power supply connected to the crate with the resistive loads, the supply should be loaded as follows

      66 Amps on the +5Vdc
      71 Amps on the +3.3Vdc
      9.3 Amps on the +12Vdc
      9.3 Amps on the -12Vdc

      Note: These values were chosen given the load boards available at the time of the initial checkouts. Approximate load values will work as well.

   b) Turn the supplies on and verify that the output as viewed on the front panel display is within tolerance. Also note the voltage at the rear terminals using a DVM into the table. If the reading on the front panel display is out of tolerance adjust the nominal voltage using the front panel interface.

Output	Front Panel Diplay Voltage	Measured by DVM
+5Vdc	(4.975 to 5.025)	
+3.3Vdc	(3.275 to 3.325)	
+12Vdc	(11.975 to 12.025)	
-12Vdc	(-11.975 to -12.025)	

   c) Is the front panel readings within +/- 0.3 Volts of DVM readings (Pass / Fail)

   d) Operate the power supply under this load for 4 hours. Periodically check the output voltages and for any sign of malfunction as indicated by the front panel interface.

2. Recovery Time Test
   e) With the power supply connected to the crate with the resistive loads, the supply should be loaded as follows

66 Amps on the +5Vdc
71 Amps on the +3.3Vdc
9.3 Amps on the +12Vdc
9.3 Amps on the -12Vdc

a) While monitoring each voltage with an oscilloscope measure the amount of time the power supply output deviates +/- 1% from nominal when the loads are varied in the manner listed in the table below.

Output	From	To	Recov. Time	Pass/Fail (< 0.2 ms)
+5Vdc	66Amps	51 Amps		
+5Vdc	51 Amps	66 Amps		

3. Output Ripple Test

a) Connect the power supply to a crate containing passive resistive load boards. Load each output as follows:

66 Amps on the +5Vdc
71 Amps on the +3.3Vdc
9.3 Amps on the +12Vdc
9.3 Amps on the -12Vdc

b) Using an oscilloscope (AC coupled, BW limited to 20 MHz) with a differential probe, measure the amount of voltage ripple on each output.

Output	Measured Ripple Voltage, peak to peak	Pass / Fail
+5Vdc	(< 20 mV)	
+3.3Vdc	(< 20 mV)	
+12Vdc	(< 20 mV)	
-12Vdc	(< 20 mV)	

4. Conducted EMI Test.

The procedure for setting up the test equipment for the Conducted EMI measurement is given in the Appendix.

a) Connect the power supply to a crate containing the passive resistive load boards as in the previous test.

b) Connect the power supply AC power cable to the AC power output of the LISN and restart the power supply.

c) Connect the 50 Ohm BNC Output of the LISN to the HP8591EM spectrum analyzer through the HP11947A Transient Limiter.

d) Insert the Measurement ROM card into the HP8591EM.

e) Make the following settings on the HP8591EM:

Preset
Save/Recall
Recall Internal
Internal -> State
1
Enter
Setup
More
Limit Lines
Limit 1
Limit 1 ON
Previous Menu
Limit 2
Limit 2 ON
Limit Test ON

f) Is the noise spectrum within the displayed limits. If the trace fails limit 2 note it in the margin. If the trace fails limit 1, Fail the supply (Pass / Fail).

g) Save the waveform to an internal register of the analyser. Register# _____

Save/Recall
Save Internal
Trace -> Internal
Trace A
"register #" ENTER